U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Abronia alpina*

COMMON NAME: Ramshaw Meadows sand-verbena

LEAD REGION: Region 8

INFORMATION CURRENT AS OF: April 14, 2010

STATUS/ACTION

___ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
_X_ Continuing candidate
__ Non-petitioned
X Petitioned - Date petition received: May 11, 2004
_ 90-day positive - FR date:
_ 12-month warranted but precluded - FR date:
_ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:
a. Is listing warranted (if yes, see summary of threats below)?
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions?
c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded. Higher priority listing actions, including court-approved settlements, court-ordered and statutory deadlines for petition findings and listing determinations, emergency listing determinations, and responses to litigation, continue to preclude the proposed and final listing rules for the species. We continue to monitor populations and will change its status or implement an emergency listing if necessary. The "Progress on Revising the Lists" section of the current CNOR (*http://endangered.fws.gov/*) provides information on listing actions taken during the last 12 months.

___ Listing priority change
Former LP: ___
New LP: ___
Date when the species first became a Candidate (as currently defined): 1975
___ Candidate removal: Former LPN: ___
___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a

proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

___ F – Range is no longer a U.S. territory.

___ I – Insufficient information exists on biological vulnerability and threats to support listing.

___ M – Taxon mistakenly included in past notice of review.

___ N – Taxon does not meet the Act's definition of "species."

___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: *Nyctaginaceae (*Four-O'Clock *family)*

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: California

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE:
Tulare County, California

LAND OWNERSHIP
The only known sites of this species are located on land owned by the U.S. Forest Service. Property within the center of Ramshaw Meadow and adjacent to the sand flats supporting *Abronia alpina*, was privately owned by Mammoth Meadows Associates, but in 2004, a land exchange was completed and all of Ramshaw Meadow is now under U.S. Forest Service jurisdiction.

LEAD REGION CONTACT Andy DeVolder (R8) 916-414-6464, Andy_Devolder@fws.gov

LEAD FIELD OFFICE CONTACT: Karen Leyse (SFWO) (916) 414-6600, Karen_Leyse@fws.gov

BIOLOGICAL INFORMATION

Species Description

Abronia alpina is a small, generally glandular, deeply-rooted perennial herb, 2.5 to 15.2 centimeters (1 to 6 inches) across forming compact mats. The flowers are lavender-pink, trumpet-shaped, and generally fragment with 4-5 lobes. (Wilson 1970, p. 204)

Photo by James Andre

Taxonomy

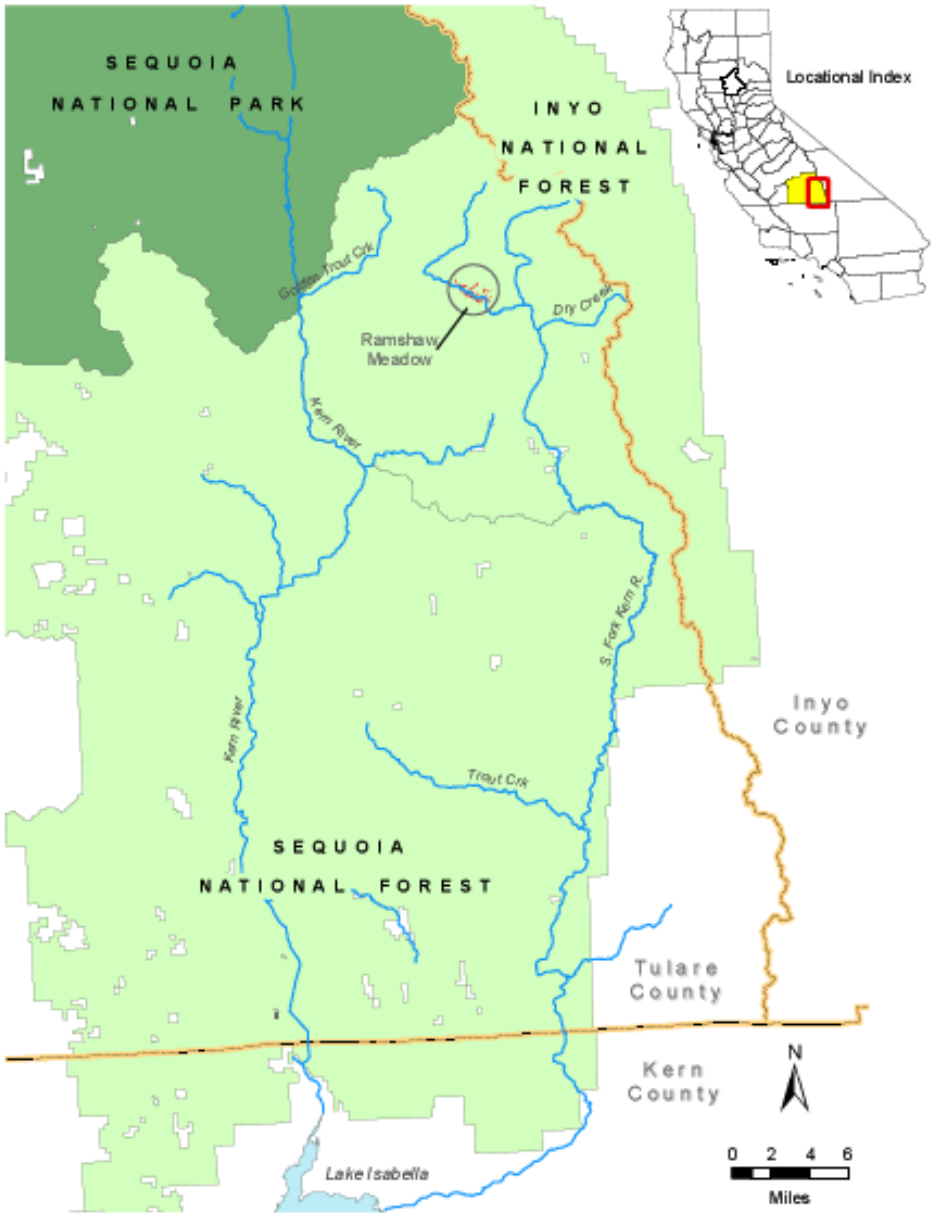
Townshend Brandegee described this taxon in 1899 from specimens collected by Joseph Purpus at "Monatchy" [Monache] Meadows near Mt. Whitney in 1896 (Brandegee 1899, p. 456). For a number of years, this species was thought to have been extirpated, but it was rediscovered in 1970 in Ramshaw Meadow, Tulare County, California. No plants have ever been found at Monache Meadow. This reference is probably to what is now called Strawberry Meadows on the southeast side of Templeton Mountain. The whole complex was once called "Monache." Otherwise, the 1896 collection was either referenced erroneously as the type collection or has since become extirpated.

Habitat/Life History

The plant is found on arkosic gravel meadow margins between lodgepole pine forest and sagebrush scrub communities surrounding Ramshaw and Templeton Meadows. Elevation ranges between 2,621 to 2,652 meters (m) (8,600 to 8,700 feet (ft)). The soils are sterile, porous, subject to extreme diurnal temperature change and easily disturbed (Wilson 1970, p. 203). The plants are distributed across these sandy meadow margins blooming from July to August. Most plants are solitary, however mats can sometimes be made up of several individuals. After flowers set the seeds are deposited under the parent plant, limiting dispersability (Shevock 1977, page 1; USDA 1995, p. 15).

Historical and Current Range/Distribution

Abronia alpina is known from one main population center in Ramshaw Meadow on the Kern Plateau of the Sierra Nevada and from one subpopulation found in adjacent Templeton Meadow. Of the 34 recognizable subpopulations, all but the Templeton Meadow population, are found around the borders of Ramshaw Meadow. Much of the Kern Plateau was surveyed specifically for *Abronia alpina* during the summers of 1984-1989, and additional miscellaneous botanical and ecological work on the Kern Plateau in the ensuing years has not located any additional populations. It is unlikely that additional surveys will locate new populations. The total estimated area occupied is approximately 6.25 hectares (15 acres) (USDA 1995, p. 1).



Population Estimates/Status

Population estimates from 1985-2006 range from a low of 62,056 plants in 2006 to 132,215 plants in 1987. Surveys conducted since 1994 indicate that no significant changes have occurred in population size or location, although, the 2006 survey showed population numbers to be at the low end of the range. The population fluctuates from year to year without any clear trends (USDA 1995, p. 2).

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Lodgepole pine is becoming established within *Abronia alpina* habitat in some subpopulations. Currently, it appears that in two subpopulations, up to 20 percent of the area potentially occupied by *Abronia alpina* is now occupied by relatively young (<30 years) lodgepole pine. In addition, smaller portions of the habitat for seven other subpopulations are occupied by young lodgepole pine. Lodgepole pine encroachment may alter soil characteristics by increasing organic matter levels, decreasing porosity, and moderating diurnal temperature fluctuations thus reducing the competitive ability of *Abronia alpina* to persist in an environment more hospitable to other plant species. The rate at which encroachment is occurring has not been determined, although the latest evaluation in 2003 did not indicate that the encroachment is, yet, problematic. The Forest Service conducts pine encroachment evaluations with monitoring photographs and species surveys every three years.

The Ramshaw Meadow ecosystem is subject to potential alteration by lowering of the water table due to downcutting of the South Fork of the Kern River (SFKR). The SFKR flows through Ramshaw Meadow, at times coming within 15 m (50 ft) of *Abronia alpina* habitat, particularly in the vicinity of five subpopulations. The habitat occupied by *Abronia alpina* directly borders the meadow system supported by the SFKR. Drying out of the meadow system could potentially affect *Abronia alpina* pollinators and/or seed dispersal agents. In Ramshaw Meadow and in other meadow systems within the same watershed, livestock trampling, along with the removal of bank stabilizing vegetation by grazing livestock, has been at least partially responsible for the downcutting of the SFKR (USDA 1995, p. 3; Stephens *et al.* 2004, pp. 31-32).

Established hiker, packstock, and cattle trails pass through *Abronia alpina* subpopulations. Two main hiker trails pass through Ramshaw Meadow, but were rerouted out of *Abronia alpina* subpopulations where feasible, in 1988 and 1997. Remnants of cattle trails that pass through subpopulations in several places receive occasional incidental use by horses and sometimes hikers. Cattle use, however, currently, is not a threat due to the 2001 implementation of a ten year moratorium on the Templeton allotment which prohibits cattle from all *Abronia alpina* locations.

Subpopulations are subject to trampling by packstock and campers in addition to trampling from use of the trail. Campsites have been removed from four subpopulations locations. Resource crews may have removed other campsites that were unreported. Some of these campsites have occasionally recurred. One campsite adjacent to two subpopulations has resulted in trampling of

these subpopulations on occasion. These are all informal campsites, established by users.

Significant trampling of *Abronia alpina* subpopulations by cattle has occurred in the past. Some of the subpopulations are protected by fencing, while the protection of other occurrences was dependent on close adherence to the trailing route. In 2001, the U.S. Forest Service made the decision to discontinue grazing on the Templeton allotment, which includes Ramshaw Meadow, for a period of 10 years. The U.S. Forest Service is currently collecting data on meadow and streambank heath as part of its analysis regarding the decision to potentially reissuing grazing permits for the Templeton allotment. Public input will be required prior to re-establishing grazing within the allotment.

In January 2004, the U.S. Forest Service amended the Sierra Nevada Forest Plan Amendment, based on the final supplemental environmental impact statement (FSEIS) (USDA 2004), following a review of vulnerability assessments conducted on 135 threatened, endangered, proposed-for-listing, and sensitive plant species. It was determined that livestock grazing posed a threat to this species. Livestock grazing in Ramshaw and Templeton Meadows (where the plant is endemic) does not currently pose a threat because this allotment is now vacant. However, the FEIS notes that future decisions to allow livestock grazing will consider effect to this species and may require updating the Conservation Agreement (USDA 2004).

B. Overutilization for commercial, recreational, scientific, or educational purposes.

None known.

C. Disease or predation.

Gopher activities may result in significant destruction of *Abronia alpina*. Whole plants have been known to disappear, possibly either eaten or used for den building. In some areas, soil has been pushed up around gopher burrows completely covering the *Abronia alpina* plants. *Abronia alpina* is not eaten by cattle or deer, but light grazing by rabbits and gophers has been observed. (USDA 1995, p. 2). Disease is not known to be a factor at this time.

D. The inadequacy of existing regulatory mechanisms.

In 2007, U.S. Forest Service drafted a Conservation Agreement for *Abronia alpina* that would provide protective measures via increased management of recreation in the area, habitat management and research on *Abronia alpina*. Approval of this Agreement is anticipated in Fiscal Year 2010/2011.

E. Other natural or manmade factors affecting its continued existence.

Abronia alpina appears to have very poor seed dispersal capability which may have contributed significantly to the species rarity. As the anthocarp (fruit) matures, the peduncle (stalk) recurves, plunging the mature fruit beneath the plant, and thereby limiting its means of dispersal. This

serves to retain anthocarps on favorable sites, thus reducing the probability for dispersal downslope into meadow and sagebrush habitat where establishment is not possible. However, this mechanism is also restrictive in that it does not provide any apparent means for dispersal of anthocarps to more distant favorable sites. No dispersal vectors have been identified. (USDA 1995, p. 1).

Abronia alpina exhibits a predominantly monocarpic reproductive schedule (one fruiting period during the life cycle), resulting in low fecundity. Monocarpic plants rarely produce more than about 10 flowers in their abbreviated lifetimes (USDA 1995, p. 21).

The fragmented nature of the population may limit gene flow and contribute to poor resiliency. The population is fragmented into several subpopulations by breaks in habitat, such as forested areas or rock outcrops, between the sand flats. It is unclear whether or not these breaks in habitat are substantial enough to limit genetic interchange between subpopulations (USDA 1995, p. 2).

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

Grazing allotments for the two meadows have been discontinued and recreational trails have been diverted around the area containing the species. The Forest Service has developed a management plan for the species and forwarded a draft conservation agreement with the Service for the species. The conservation agreement is currently being reviewed by the two agencies. We also have provided funding to the Forest Service to analyze monitoring data; determine habitat requirements; assess dispersal limitations; determine seed viability and genetic isolation of populations; and determine pollination strategy for *Abronia alpina*.

SUMMARY OF THREATS

Due to the extremely limited geographic range of the species, factors such habitat destruction and alteration can pose a serious threat to the species. *Abronia alpina* apparently is slow to recover from disturbance because of reproductive and dispersal limitations, short life span, and high annual fluctuation in population numbers. Non-adaptive forces such as inbreeding depression may also threaten the species when combined with the fragmented distribution of the subpopulations. We find that *Abronia alpina* is warranted for listing throughout all its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

For species that are being removed from candidate status:

___Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE)?

RECOMMENDED CONSERVATION MEASURES

Continue to work with the Forest Service in developing a conservation strategy and continue to provide funding for necessary research as identified with the Forest Service.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11*
		Subspecies/population	12

Rationale for listing priority number:

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species. We reviewed the available published and unpublished scientific and commercial information, and information submitted to us during our review. On the basis of this review, we find that the listing of *Abronia alpina* is warranted but precluded by pending proposals for other species with higher listing priorities.

Magnitude: The magnitude of threats to *Abronia alpina* was determined to be moderate. *Abronia alpina* face multiple ongoing threats from forest encroachment, cattle grazing, and human activities that cause direct mortality and degradation of habitat, and the species has declined accordingly. The magnitude of threats was determined to be moderate, rather than high, because all of the species' range occurs on Federal land, which protects the species from private development and facilitates management of the species by Federal agencies. As of 2004, the Forest Service has vacated the cattle grazing allotment from the two meadow areas where the species is found but has not precluded a decision change later in time.

Imminence: The imminence of threats to *Abronia alpina* was determined to be non-imminent. Threats are ongoing, but no major imminent change in threats is expected.

_X_ Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? After reviewing the current status and distribution of *Abronia*

alpina and the threats associated with the species we have determined that an emergency listing of the species is not warranted at this time. *Abronia alpina* occurs entirely on Federal land and the two locations are not subject to development pressures. Grazing allotments for the two meadows have been discontinued and recreational trails have been diverted around the area containing the species. The Forest Service has developed a management plan for the species and forwarded a draft conservation agreement with the Service for the species.

DESCRIPTION OF MONITORING

We will continue to coordinate efforts with the U.S. Forest Service on protecting and monitoring the two areas containing *Abronia alpina*. Every three years, the Forest Service conducts monitoring surveys that collect species distribution, abundance, and age class data. The monitoring also includes assessment of trampling damage in Ramshaw Meadow due to off-trail hiking and pack-stocking. We have funded studies on conducting molecular genetics analysis, a pollination experiment, and a habitat suitability study which will examine the causes of endemism in *Abronia alpina.* The results of the studies are not final, but are expected sometime in 2010.

COORDINATION WITH STATES

The state of California does not have a status for this plant and therefore no coordination occurred.

Indicate which State(s) did not provide any information or comments: none

LITERATURE CITED

Brandegee, T. S. 1899. New Species of Western Plants. Botanical Gazette Vol 27, p. 456.

Shevock, J. R. 1977. U.S. Forest Service status report on *Abronia alpina*. Unpublished. 6 pp.

Stephens, S. J.; C. McGuire; and L. Simms. 2004. Conservation Assessment and Strategy for the California Golden Trout (*Oncorhynchus mykiss aguabonita*) Tulare County, California. 91 pp.

USDA Forest Service. 1995. Species Management Guide for *Abronia alpina*. 29 pp.

USDA Forest Service. 2004. Sierra Nevada Forest Plan Amendment, Final Supplemental Environmental Impact Statement. Volume 1, Chapter 3, Part 2, p 173.

Wilson, R. C. 1970. The Rediscovery of *Abronia alpina*, a rare specialized endemic of sandy meadows in the Southern Sierra Nevada, California. Aliso, June 22, 1970, Vol. 7 No. 2 pp. 201-205.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: _____
Regional Director, Fish and Wildlife Service Date 6.7.2010

Concur: _____ ACTING
Director, Fish and Wildlife Service Date: October 22, 2010

Do not concur: _____
Director, Fish and Wildlife Service Date

Director's Remarks:

Date of annual review: April 14, 2010
Conducted by: Arnold Roessler

FY 2010, R8 CNOR: Ramshaw Meadows sand-verbena